

in Florida, U.S.A., where a thiarid snail of the genus *Tarebia*, believed to be a host species of the Oriental Lung Fluke, *Paragonimus westermani*, has become feral following its introduction with aquatic plants from the Philippines (Morrison, 1954). The present local situation suggests that the quarantine procedures, which should control the entry of exotic organisms into Australia, are not fully effective. In our opinion, a national survey of the aquarium molluscs of Australia is overdue in view of the association of some freshwater snails, such as *L. (P.) columella*, with parasitic diseases of man and livestock.

We thank Dr. J. B. Burch, now of the Australian Museum, Sydney, for the identification of specimens and Dr. W. F. Ponder, Australian Museum, for information regarding the New South Wales occurrence of *L. (P.) columella*. The illustration was drawn by Lesley J. Gilchrist.

REFERENCES

- BORAY, J. C. and D. F. McMICHAEL 1961. The identity of the Australian lymnaeid snail host of *Fasciola hepatica* L. and its response to environment. *The Australian Journal of Marine and Freshwater Research*, 12: 150-163.
- CLIMO, F. N. and N. B. Pullan 1972. A taxonomic review of the family Lymnaeidae (Mollusca: Gastropoda) in New Zealand. *Journal of the Royal Society of New Zealand*, 2: 5-13.
- HUBENDICK, B. 1951. Recent Lymnaeidae. *K. svenska Vetensk Akad. Handl.*, 3: 1-223.
- MORRISON, J. P. E. 1954. The relationships of Old and New World melanians. *Proceedings of the United States National Museum*, 103: 357-394.
- PONDER, W. F. 1975. The occurrence of *Lymnaea (Pseudosuccinea) columella*, an intermediate host of *Fasciola hepatica* L., in Australia. *Australian Veterinary Journal* (in preparation).
- PULLAN, N. B. 1970. The first report in New Zealand of *Lymnaea columella* Say (Mollusca: Gastropoda), an intermediate host of the Liver Fluke *Fasciola hepatica* L. *New Zealand Veterinary Journal*, 17: 255-256.
- ROBINSON, A. 1949. An introduced pond snail in the Murray District. *The Western Australian Naturalist*, 2: 47-48.

SOME ASPECTS OF ABORIGINAL OCCUPATION SITES IN THE PERTH METROPOLITAN AREA.

By B. BLURTON and P. RANDOLPH, Aboriginal Sites Department, W.A. Museum.

When living off the land (before Europeans arrived) Aborigines often camped on the coastal plain. Such places are referred to as occupation sites.

Several sites are known throughout the Midland, Kewdale and Lynwood areas, as well as along the Darling Scarp. (Ackerman, 1969; Butler, 1958 and Hallam, 1972, 1973). The general characteristics of these sites are as follows: they are often situated near permanent water sources; on sandy ridges; usually with little or no vegetation where there is evidence of an artefact scatter. Therefore, if you came across a site, you would find artefacts scattered on the ground.

The earliest phase of occupation can tentatively be divided into Inland and Coastal localities. Inland refers to sites on and around the scarp. The artefacts associated with this locality are pebble choppers and steep edge scrapers (including horse-hoof scrapers) often made from dolerite. Some of these artefacts are river washed stones that have been flaked only once, the sharp edge making an adequate cutting tool. Coastal areas start from the foot of the scarp continuing across the sandy coastal plain to the sea. Artefacts found in this area are steep scrapers on flakes and scrapers made from



Fig. 1.—A general view of a site on a sandy ridge with a permanent water course nearby.

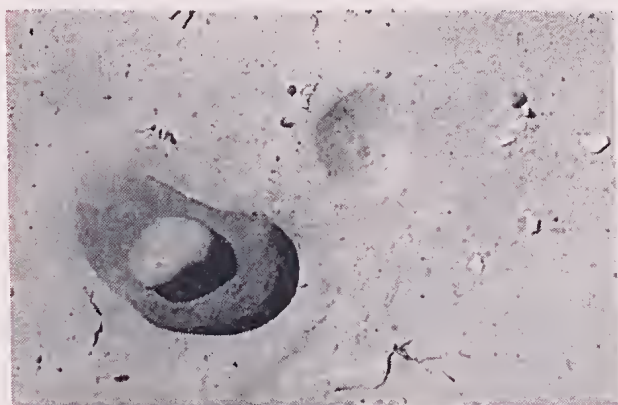


Fig. 2.—Grinding stone with grinder and other artefacts scattered nearby.

fossiliferous chert. The source of fossiliferous chert seems to have become unaccessible at about 5,000 years B.P. (before present) and therefore the early phase dates back beyond 5,000 years.

A middle phase is apparent between about 5,000 years and 500 years ago. This is characterised by the use of quartz and a fine green chert modelled into the shape of backed blades, adzes, scrapers and other flakes.

The late phase from 500 years ago up to the time of European contact in the middle 1800's saw another change in the artefact assemblage in the form of 'fabricators'. The assemblage also includes lots of quartz flakes, chips, and waste material. 'Fabricators' are prepared by smashing quartz nodules between two other rocks. The resulting artefacts are effectively flaked from both ends creating two sets of cutting edges which could be used as tools. It is likely that because of their small size 'fabricators' were mounted with gum on wooden implements.

Glasslike material (European hottles, poreclain, etc.) was introduced later, and was often flaked and made into traditional artefacts. The range of artefacts at the Walyunga site includes pieces of pottery, claypipes and bottle glass. This is evidence of European contact which in the years that followed changed the Aboriginal life style till traditional tools of stone were no longer to be found at sites.

In traditional times a camp would almost always be set up near a water source, because there is usually food to be found in association with good water sources. Some of the more permanent sites can be pinpointed because grinding stones have been found on location, indicating that grass and other seeds were probably prepared for eating at the spot. It is probable that some sites were occupied seasonally over long periods, showing evidence of more than one phase of occupation, while others were merely visited on a random basis. An analysis of the artefact material provides an assessment of the past use of the site.

We are grateful to Mrs S. J. Hallam, W.A. University, for much of the information concerning the phases of occupation sites in the metropolitan area.

REFERENCES

- AKERMAN, K. 1969. Walyunga an Aboriginal site near Perth. *Ilchinkinja. Journal of W.A. Anthropological and Sociological Students Association*, 3.
- BUTLER, W. H. 1958. Some previously unrecorded Aboriginal artefact sites near Perth W.A. *W.A. Naturalist*, 6 (6).
- HALLAM, S. J. 1972. An archaeological survey of the Perth area, W.A. *Australian Institute of Aboriginal Studies Newsletter*, 3 (5) November 1972.
- HALLAM, S. J. 1973. Ecology and demography in southwestern Australia. *Journal of the Royal Society of W.A.*, 56 (1 & 2): 46-48.

PRESENTATION OF INFORMATION IN BIOLOGICAL SURVEYS OF NATIONAL PARKS

By FRANCIS G. SMITH, Director, National Parks Board of Western Australia.

In order that the information obtained from biological surveys of national parks may have some relevance to ecological management, it is essential that it be presented in an appropriate form.

It is suggested that the report of a survey should contain the following appendices:—

1. A map of vegetation types—(Plant Associations/Formations)—at the largest scale practicable. This should follow the criteria of the W.A. Vegetation Survey Committee. (See Vegetation Maps Pemberton/Irwin Inlet 1972, Busselton/Augusta 1973, Collie 1974).

2. For each vegetation type or plant community the following information is required:—

- (a) Name of Plant Association—Formation.
- (b) Location—include grid reference or latitude and longitude.
- (c) Vegetation System (if one has been recognised by earlier work or by the current survey).
- (d) Habitat—brief description of topography, climate, soil, rock and other edaphic factors.
- (e) Brief description of community with notes on effect of fires, actual or estimated time since last fire. Notes on regeneration.
- (f) Floristic Composition (table).

The table of the floristic composition should be presented in order of importance in the community under the following headings:—